Tips & Tricks for Safe CT Scans – Good Habits to Develop

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Technologist roles and responsibilities

Proper positioning

Technical tricks

Knowing your scanner
Technologist Roles and Responsibilities
American Registry of Radiologic Technologists
R.T.(R)

Advanced certification
MR, CT, M, CV

Recertification via CEUs-24 CEUs biannually
Additional State Licensure-up to the states to requires licensure, each have different requirements
H.R. 2104 CARE Bill-Consistency, Accuracy, Responsibility and Excellence in Medical Imaging and Radiation Therapy
ALARA
This is each technologist's responsibility.
Important to work in conjunction with your RADIOLOGIST and PHYSICIST.
Positioning and Iso-center
Topograms or Scouts
Iso-center and dose
Wasted Dose!
Position patient correctly so that radiation is not applied to sensitive areas.
For exams like pediatric heads or neuro perfusions, position the head so the eyes are out of the primary beam.
Many facilities still use 120kV. MUSC uses 80kV (excluding neuro). Not a huge dose savings, it is in the right direction!
Laser lights

Iso-center

Important positioning tool!
Iso-center
Automated exposure control

Must be iso-centered in the gantry

Assures proper dose distribution and beautiful images!
Patient too HIGH

Distorted topogram does influence the mAs calculation!
Too high in the gantry

Assume the patient is larger

Use a higher technique

Higher dose and images with decreased quality
Patient too LOW

Distorted topogram does influence the mAs calculation!
Too low in the gantry

Assume the patient is smaller

Calculate an insufficient dose

Poor image quality
Technical Tricks
Tube current is increased for larger patients and decreased for smaller ones.

Adapts dose to the size of the patient.

Positioning and iso-centering is so important!

Similar to photo-timing in diagnostic radiology.
It also does the same for different parts of your body. Humans are not shaped like a cylinder!
Tube current adapts to the body’s size providing the proper dose!
158 mAs  
204 mAs  
197 mAs
Children should \textbf{NEVER} be considered small adults!
↑ dose (mAs or kV), ↓ noise

↑ kV, ↓ noise, ↓ contrast

↓ kV, ↑ noise and ↑ contrast-especially with IV contrast
80kV and 100kV used to reduce dose

Reduce your dose by 50 to 200%!
80 kVp
100 kVp
120 kVp
CT image acquired with filtered back projection

Images reiterated

Less image noise and better quality

Helpful when using lower doses!
Different technologies and approaches to iterative reconstruction.

Consult your representative

Explanations!

Strategies!
CT PITCH

Unhappy children
BIG Problem
Higher pitch ↓ scan time
Reduces possible repeats due to patient motion!
CT PITCH (P)

Pitch = d (per 360°)/T

- d: table movement
- T: beam width
- T \sim N \times 0.6 \text{ mm}

↓P; ↓TABLE SPEED; ↑DOSE
ROTATION TIME

Faster rotation times ➔
Decrease dose ➔
Shorter scan times
Helpful in your pediatric population
Know Your Scanner!
WHAT ARE RTs?

*NOT* button pushers!

Select Techniques

Diagnostic Task
Techniques →

Image Quality

Radiation Dose
Questions?